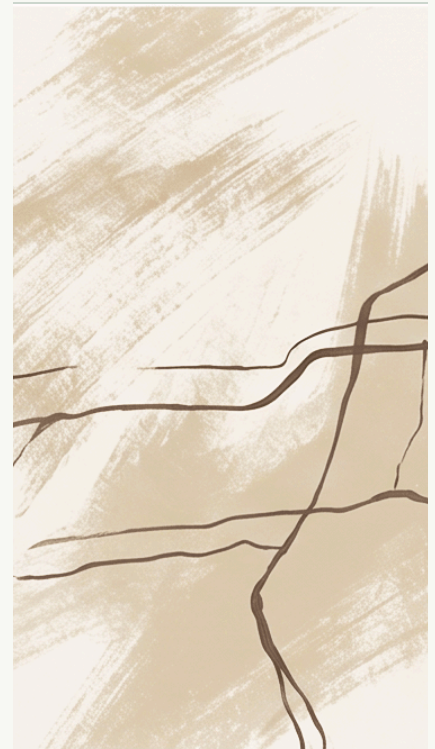


08

WHEN INTELLIGENCE CHANGES

As AI systems gain capabilities, education must cultivate the human readiness and collective agency needed to shape how AI enters learning and life.



KEY MESSAGES

- Human readiness extends beyond technical literacy to the psychological, cognitive, and relational dimensions learners need to retain judgment, agency, and meaningful human relationships.
- AI systems carry epistemic and material conditions into education—from whose knowledge and languages become legible to the energy, water, minerals, and infrastructures that sustain them—making AI an issue of educational, ecological, and epistemic justice.
- Learners and educators need meaningful decision-making roles about how AI is selected, designed, governed, and used in education, shifting their position from recipients of technological change toward participants in shaping it.
- AI futures remain open. Education can strengthen the capacities and collective agency through which people question technological inevitability and participate in shaping more plural futures.

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INSIGHT

Artificial intelligence has entered education from every direction, and often the loudest debates treat it as a race to keep pace and stay competitive. Yet AI is becoming more than another educational technology. The same systems that answer a student's homework question also rank what young people and others see about themselves. These systems shape people's experiences and opportunities in two distinct ways. Some act as intermediaries between learners and their world, shaping what is seen and what is skipped. Beliefs are still formed by the person, but increasingly in relation to the information and environments the system supplies. Others make decisions with real-world consequences, shaping access to jobs, loans, and educational opportunities. Young people are now growing up inside the first system and beneath the second. The worldviews formed through their interactions with these systems shape how learners understand themselves and their relationships with other people and the planet.

AI brings fundamental questions about education into unusually sharp focus: what counts as knowledge, what education values in human learning, how relationships are mediated, what remains unnoted, unmeasured, whose interests shape technological systems, and who gets to participate in shaping educational futures. Global dialogues, including the 2025 Global Forum on the Ethics of AI in Bangkok, have called for critical and values-based AI literacy, knowledge diversity, and more participatory approaches to AI and learning (BRIDGES et al., 2026). Yet the accelerating presence of AI across learning and everyday life raises questions that reach beyond AI literacy alone. AI is entering not only classrooms but the wider environments through which people learn and come to know the world: media, play, and conversation; the bond a child has with a grandparent; an encounter with an animal or a stretch of unsettled land; and the everyday settings through which we come to know the world, both human and more-than-human. Across these settings, ways of relating, judging, and trusting take shape and continue to develop over the course of a lifetime. AI is increasingly entering these spaces as well, often before learners encounter it through a formal curriculum (OECD, 2025; UNICEF, 2025; Burns et al., 2026). This matters because learners may already be forming habits of trust, judgment, and relationship with AI before education explicitly asks them to examine those relationships.

The implications of AI also differ across developmental stages. Younger learners may encounter algorithmically mediated environments while developing a sense of self or learning both to trust their own judgment and to stay with uncertainty. Older learners face different questions as AI increasingly takes on cognitive and relational functions they might otherwise exercise themselves. What a younger learner may still be developing, an older learner may increasingly need to exercise and sustain. Across these differences, three questions become central: What do learners need to engage with AI critically and well? What epistemic and planetary conditions structure the systems they encounter? And who gets to shape how AI enters learning and life?

BEYOND AI LITERACY: HUMAN READINESS

Responses to AI in education now swing between the extremes of mandating AI training on the one hand and classroom bans on the other. Both treat the technology as the thing to manage while the human remains unexamined. Underlying both is the same assumption that deployment amounts to

readiness, that exposure produces the capacities learners need, and that adaptation will happen on its own. The impulse behind critical AI literacy is important: learners need to understand how these systems work, where they fail, whose interests they serve, and how to engage with them critically and responsibly (Miao et al., 2024). But even strong forms of critical AI literacy leave a deeper question.

This insight builds on Sellick's (2026) Human Readiness framework, which shifts attention from what learners need to know about AI to what they themselves must remain able to do as AI becomes increasingly woven into learning and life. The framework foregrounds three interconnected dimensions of readiness: psychological, cognitive, and relational. Psychologically, readiness involves sustaining a sense of self and agency in encounters with systems increasingly capable of capturing attention and simulating intimacy or attachment. Cognitively, it means sustaining independent judgment: noticing what is being asked of learners, answered for them, and ignored on their behalf, and noticing when fluent answers let performance outpace understanding. Relationally, readiness involves bringing what was formed through human bonds to encounters with entities that simulate them (Sellick, 2026; Burns et al., 2026). It also means valuing human bonds themselves and what they teach through empathy, repair, patience with imperfection, reciprocity, vulnerability, and forms of friction that synthetic interactions do not reproduce in the same ways.

A learner can understand that a companion chatbot is designed to sustain engagement and still feel the pull of its validation. They can also know that fluent answers can be inaccurate and still accept them without scrutiny. Readiness is also uneven: the same system that steadies one learner may unsettle another, depending on stress, prior understanding, loneliness, and circumstance. Mandates and bans alike can assume a uniform learner, and there is no such learner. Emerging research on adolescent use of AI companions reinforces this concern: young people use these systems for social interaction, emotional support, and serious conversations, raising questions about trust, attachment, and relational development (Robb & Mann, 2025).

Yet when human–AI interaction is evaluated, the machine is what gets measured. Developers benchmark capability, safety teams assess for harm, institutions track adoption. Where human subjectivity appears, it is often reduced to metrics such as satisfaction, engagement, or performance with the tool. Far less visible is what sustained interaction enables, displaces, strengthens, or weakens in learners. Generating information has become effortless, yet understanding depends on effort. Understanding remains slow, embodied, situated in a life and a place. Early evidence illustrates this distinction: high-school students given unrestricted AI assistance improved during practice but performed worse than peers without such assistance once the tool was withdrawn (Bastani et al., 2025). The educational question is therefore larger than whether AI improves immediate performance: what remains when the tool is removed—not only in what learners know, but in how they understand learning, knowledge, and their own agency?

Human readiness cannot be separated from institutional readiness. Education systems must also exercise judgment about where AI adds value, where human relationships and expertise should remain central, what learning deserves time and attention, and what should not be delegated to technological systems.

EPISTEMIC AND PLANETARY CONDITIONS: MAKING THE INVISIBLE VISIBLE

Behind the visible tools sit invisible conditions: what trains them, what powers them, and at what cost. Whose language and knowledge train these systems? Whose knowledge and values become legible to these systems, and whose remain invisible or marginalized? When AI enters classrooms, it carries assumptions about what constitutes knowledge. Underrepresented ways of knowing, including local, traditional, and Indigenous knowledge, may become less visible or legible only through categories that do not reflect their own epistemological foundations (UNESCO, 2026; Kwok, 2026). The knowledge that trains the system shapes what learners encounter and may influence what they come to trust, making AI a question of epistemic justice as well as technical competence.

The question is therefore larger than whether AI systems contain sufficiently diverse information. It concerns how particular systems make some ways of knowing visible while rendering others marginal, extractable, or commensurable on terms not their own (Kwok, 2026). Learners need opportunities to ask not only whether an AI-generated answer is accurate, but whose knowledge makes that answer possible, what assumptions organize it, and what remains outside its frame.

These epistemic inequalities are entangled with the material geographies through which AI is built. AI depends on energy, water, minerals, data centers, semiconductor supply chains, and other physical infrastructures whose environmental burdens are unevenly distributed (Hlabisa, 2025; Xiao et al., 2025). These infrastructures make AI a planetary as well as technological question. Education can leave these conditions invisible or bring them before learners as questions worth investigating. Technologies that appear frictionless at the interface remain embedded in material landscapes, political economies, labor, and relationships of extraction.

COLLECTIVE AGENCY: FROM USERS TO ACTORS

In AI policy, both educators and young people tend to be framed primarily as users. They are often positioned as people expected to develop the skills required to adapt to new technologies (Faul, 2024). Yet learners and educators are also knowledge holders and actors, with a stake in how AI enters education and with experience that should inform decisions about its design, selection, deployment, evaluation, and governance (UNESCO, 2021; UNICEF, 2025). Such a scenario requires building not only training programs but appropriate participatory structures. Students, teachers and the institutions that learn with them need a seat at the table when tools are chosen, and a voice in what gets piloted for and with them—not just on them.

This is also a question of power. The capacity to shape AI is distributed far less evenly than the consequences of its deployment. A generation that only ever receives AI tools, without also shaping decisions about how they are introduced, risks learning that someone or something else has the overall say in the decisions being made for and about them. Participation in AI governance is therefore itself educational: how institutions select, procure, introduce, and govern AI teaches learners something about whose judgment matters and who has agency in shaping technological change (UNICEF, 2025).

This opens the question beneath all three challenges. Before asking how to use AI more effectively, the education sector, as indeed all sectors of society, needs to ask to what end these uses are being defined. Does the technology help us live with uncertainty, or does it reinforce the belief that increasingly complex futures can be predicted, answered instantly, and optimized until they feel

controllable? None of this is inevitable. Inevitability is itself a narrative, one that can narrow the space for questioning and collective choice. The work of education opens up different narratives: preferred futures that young people can see themselves building, and renewed value for the experiential, embodied, and relational ways of learning and being.

Taken together, these challenges shift the educational question posed by AI. The task is larger than preparing learners to use increasingly capable technologies. It means enabling learners to judge, relate, question, and act; making visible the epistemic and planetary conditions behind AI systems; expanding collective agency over how those systems enter learning and life; and strengthening the capacity of education systems themselves to decide what should—and should not—be delegated to AI. Education has a vital role to play in keeping futures plural. But this responsibility does not rest with learners or educators alone. It is shaped by the institutions, governments, technology companies, funders, and other actors involved in developing, financing, selecting, governing, and bringing AI into collective life. Education's task is not simply to prepare learners for an AI-shaped future, but to enable them to participate in determining what role AI should have in learning and life.

08 Pathways for transformation

- 01 Evaluate the human side of human–AI interaction.** Alongside measures of machine capability, safety, and adoption, examine what learners are gaining, keeping, or ceding through their interactions with AI.
- 02 Make human readiness explicit in AI literacy.** Extend literacy efforts beyond understanding and using tools to encompass the psychological, cognitive, and relational dimensions that critical engagement requires.
- 03 Build institutional readiness alongside human readiness.** Education systems must exercise judgement about where AI adds value, where human relationships and expertise should remain central, what learning deserves time and attention, and what should not be delegated to AI.
- 04 Seat learners and teachers at the table.** Give them meaningful roles in the selection, procurement, piloting, evaluation, and governance of AI, as actors shaping how it enters education rather than simply recipients of training.

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- 05 Make AI's epistemic and material conditions visible.** Bring the languages, knowledge systems, labor, energy, water, minerals, and infrastructures behind AI into learning, asking whose knowledge becomes visible, whose is marginalized, who bears its material costs, and who benefits.
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- 06 Keep futures plural. Treat inevitability as a claim.** Create opportunities for learners to question assumed technological futures, imagine alternatives, and participate in determining what role AI should have in learning and life.
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ILLUSTRATIVE PATHWAYS IN PRACTICE

The examples below show different responses already taking shape: protecting space for human development, reconsidering what education should preserve in an AI-rich world, building AI from different epistemic foundations, and giving learners a role in governing the technologies that shape their lives. These are not prescriptions or models for replication, but illustrations of how different actors are creating space to question assumptions, exercise collective choice, and keep AI futures plural.

Readiness Before Access: New York City's Generative AI Moratorium

New York City Public Schools, the largest system in the United States, is asking what student readiness looks like before AI enters the classroom. For the 2026 to 2027 school year, the city introduced a one-year moratorium on student-facing generative AI from 2-K through eighth grade, impacting nearly 600,000 students, while prohibiting companion chatbots in all grades. High school students complete two 45-minute AI literacy modules focused on how AI works, data privacy and bias, and appropriate uses of AI, alongside limited opportunities for supervised use through approved programs and pilots. The pilots were selected in part for their emphasis on keeping students engaged in their own thinking and learning. A Technology in Schools Coalition—including students, educators, parent leaders, elected officials, advocates, union partners, and experts—will assess the policy and provide recommendations for the following year. The mayor and chancellor framed the policy around protecting human connection, relationships with educators, and opportunities for learners to work through difficult problems themselves. Norway adopted a similar age-differentiated approach in June 2026, recommending that students in grades 1–7 generally not use generative AI themselves for schoolwork, while allowing progressively greater use in lower-secondary and upper-secondary education. Together, these examples reflect a broader shift from asking simply how young people should learn to use AI toward asking what needs to be in place for them to engage with it well. They raise questions about what human capacities should develop before and alongside AI use, who decides when learners are ready for different forms of AI interaction—particularly chatbots—and how education systems can learn from and revise their own choices.

Learn more

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Norwegian Ministry of Education and Research. (2026, June 19). *Kunstig intelligens skal i all hovedsak ikke brukes i barneskolen* [Artificial intelligence should generally not be used in primary school].

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MIT: Re-Asking What a University Education is For

In August 2026, MIT released the report of its Ad Hoc Committee on *AI Use in Teaching, Learning, and Research Training*. The report goes beyond tools' privacy. It opens as a call to action and presses the institution toward deeper questions about the structure, meaning, and value of its education in an era in which AI is playing an unprecedented shaping role. Among its recommendations: every course states an explicit AI use policy, and the institution deepens its investment in its residential human community by treating study groups, office hours, and undergraduate research as infrastructures worth protecting. The example shows a leading global institution actively choosing its future with AI, and the choices that are already underway.

Learn more

Massachusetts Institute of Technology, Ad Hoc Committee on AI Use in Teaching, Learning, and Research Training (2026). *AI and Education*. <https://aiandeducation.mit.edu/>

Reimagining AI from Indigenous Knowledge Systems: Abundant Intelligences

Abundant Intelligences is an Indigenous-led, Indigenous-majority international research program asking a different question about AI: rather than simply making existing systems more inclusive, what might AI become if its foundations were reimagined through Indigenous knowledge systems? Working through locally rooted research Pods, Indigenous knowledge holders, language keepers, cultural practitioners, students, scientists, artists, and engineers collaboratively imagine, design, and prototype culturally grounded AI. Projects connect AI with Indigenous language revitalization, storytelling, land stewardship, creative practice, and community priorities. The initiative demonstrates that epistemic justice in AI reaches beyond representation in training data; it also concerns who defines intelligence, whose protocols govern technology, and who has the power to shape what AI becomes.

Learn more

Abundant Intelligences

<https://abundant-intelligences.net/>

Lewis, J. E., Whaanga, H., & Yolgörmez, C. (2025). Abundant intelligences: Placing AI within Indigenous knowledge frameworks. *AI & Society*, 40, 2141–2157. <https://doi.org/10.1007/s00146-024-02099-4>

From Users to Actors: Student AI Councils

Student AI councils offer one pathway for moving learners from users to actors in AI governance. At Study Hall School in Lucknow, India, students formed an AI task force to investigate AI's benefits and risks, develop guidelines for responsible use, contribute to school policy, and lead dialogue with peers. Similar models could give learners meaningful roles in testing AI tools, shaping policies, redesigning learning, and informing procurement. The significance reaches beyond AI literacy: participation itself becomes educational, giving young people experience in deliberating about technologies that increasingly shape their learning and lives.

Learn more

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